

CHARGE QUESTIONS (August 17, 2005)
World Trade Center Signature Study Peer Review

BACKGROUND

In the days following the terrorist attack on New York City's World Trade Center (WTC) towers, EPA, other federal agencies, and New York City and New York State public health and environmental authorities initiated numerous air monitoring activities to better understand the ongoing impact of emissions to the outside environment from that disaster. In 2002, EPA's Region 2 turned its attention to the indoor environment, providing a volunteer "clean and test" or "test only" program for residents and homeowners who wished to have their apartments cleaned and/or tested. Asbestos was selected as a surrogate for the presence of WTC-related contamination for this program.

In March 2004, EPA convened the WTC Expert Technical Review Panel to interact with the Agency and the public on plans to monitor for the presence of any remaining WTC dust in indoor environments near Ground Zero. For more information on the WTC Expert Panel, see <http://www.epa.gov/wtc/panel>. Approximately 750 units in an area extending north to Houston Street in lower Manhattan and across the East River into a portion of Brooklyn were proposed to be sampled for contaminants of potential concern (COPC), as well as for specific constituents that can be used as markers to identify residual contamination by dust from the collapse of the WTC. These "WTC dust signature" constituents are the cornerstone of the sampling program as they will provide the basis for estimating the geographic extent of the remaining residue in dust of the WTC towers collapse. Using the results of dust sampling for the WTC building collapse signature, EPA will decide whether indoor cleanup or other activities are warranted at this time.

Based on the previous work of the United States Geological Survey (USGS) and others, EPA identified three components of the dust generated by the WTC towers collapse that could be used to screen sampled dust for the presence of WTC dust. These markers, or signature components, were mineral slag wool, gypsum and elements of concrete. EPA developed the following working hypothesis for the signature: "A dust sample that contains WTC dust will have slag wool and elements of concrete and gypsum present in 'significant quantities' when compared to typical indoor urban dust." Experts from the USGS, EPA's Office of Research and Development, EPA's National Enforcement Investigations Center, and the commercial testing laboratory community worked together to develop an analytical method to quantify the concentration of these three markers in indoor dust.

Between September 2004 and April 2005, numerous samples were taken in impacted buildings near Ground Zero and at background locations. These samples have been analyzed for these three markers to determine whether or not they validly constitute a WTC signature, as suggested by earlier USGS efforts. Also, they were used in a method validation study whose primary purposes were twofold: 1) to evaluate the analytical method with regard to method variability (as measured by both inter- and intra-laboratory variability), and cost and expediency issues, and 2) to assist in the determination of the lower limits of concentrations of the markers that could be reliably measured, and that could be reliably distinguished from background concentrations. This method validation study involved five contract laboratories and three

federal government laboratories. This study entailed spiking known background dust with varying concentrations of known WTC collapse dust, and then having the laboratories perform a blind analysis on both the spiked samples and background samples.

The charge questions focus on the following: the basis for identifying signature components; the validity of the hypothesis; whether the existence of a signature has been adequately demonstrated; and the work done to develop, validate and apply an analytical method for the three signature components.

The following documents are the primary ones being reviewed: 1) the analytical protocol used by the eight laboratories and 2) EPA and Versar (EPA contractor) reports documenting the validation study including the background and hypothesis, analyses of samples taken to verify the hypothesis, and the results and interpretation of the method validation study. Several background documents will also be available to the reviewers. These include the draft final sampling plan to be used to evaluate the presence and levels of contaminants of potential concern of any remaining WTC dust in indoor environments near Ground Zero (this plan includes an overview of the Signature Study); two USGS reports on the signature development; and other pertinent reports that provide additional background on the characterization of WTC dust. The reviewers are not being asked to provide comments on these background documents. If the reviewers believe they need any additional documents or clarification of information provided in the documentation provided, they will be supplied through the peer review contractor.

CHARGE QUESTIONS

Basis for Development of a Signature:

Q1) The following criteria were established to assist EPA in the selection of appropriate constituents in dust to be characterized as WTC signature constituents:

- a) They are present at levels unique to WTC dust (distinct from urban dust);
- b) They are persistent for many months (not volatile);
- c) They are sufficiently homogeneous in WTC dust; and
- d) Available analytical methods are able to detect these screening materials with a small sample size, low minimum detection limit, and low interference from other dust components.

Based on information in the supplied documents, and any other knowledge you may bring to the table, are these criteria adequate for establishing a WTC signature marker? If the answer is no, please elaborate.

Documentation of the Existence of a Signature:

Q2) Based on information in the supplied documents, and any other knowledge you may bring to the table, do you agree or disagree with the conclusion that slag wool alone meets the criteria as a WTC marker? Please explain your answer.

Analytical Method Development:

Q3) Are the analytical methods written in sufficient detail such that a qualifying laboratory could follow the methodology and obtain valid results without supplemental assistance from EPA or other sources?

Q4) If the answer to Question 3 is no, what items or information could be added so that a qualified laboratory could follow this protocol and obtain valid results without the assistance of the EPA or other sources?

Method Validation Study:

Q5) The method validation study design entailed spiking characterized background dust with characterized WTC dust at various levels, and then sending 32 blind samples (16 originals and 16 duplicates) of background and spiked dust to each of eight laboratories (five commercial laboratories and three government laboratories). These laboratories characterized the dust using the protocol described above and then sent the results back to EPA. Was this an appropriate design to achieve the goals of this method validation study?

Q6) Did EPA and Versar adequately evaluate and interpret the results from the eight laboratories, as documented by the supplied documents on NYC dust analyses?

Dust collected from currently occupied buildings is expected to have lower levels of the key WTC constituents as compared to dust sampled near September 11, 2001 in time or sampled more recently but in uninhabited heavily impacted buildings. EPA will use the results of this method validation study to determine the final distinguishing concentrations for the WTC marker(s). If currently sampled dust has this marker(s) at or above such a distinguishing concentration, EPA would consider the sampled dust to "contain residues of WTC dust" for purposes of estimating the geographic extent of WTC impacts and making cleanup decisions. The key requirement for a distinguishing concentration is that it be adequate to distinguish between dusts that do not contain WTC residues from those that do with a reasonably low false positive error rate.

Q7) EPA has observed differences in slag wool concentration which discriminate between background dust and dust contaminated with WTC residue. Do you agree that the data and analysis presented in the documents support this observation? Please explain your answer.

Q8) Is there any other way in which the proposed signature marker(s) can be used to determine the extent to which WTC dust may have penetrated and remains in indoor environments?

Q9) Are there any additional comments or concerns about this study that have not been addressed by these questions?